

EXHIBIT 7



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| 2613 | 20091103 |
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Commissioner for Patents

According to the order mailed on 31 October 31, the Examiner's Answer mailed 2 July 2009 has been vacated. Attached please find a substitute Examiner's Answer which includes the ground of rejection not on review for claims 12 and 14-19.

/Shi K. Li/
Primary Examiner, Art Unit 2613



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/448,559
Filing Date: May 30, 2003
Appellant(s): NGO, DAT D.

Eamon J. Wall
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 13 April 2009 appealing from the Office action mailed 19 November 2008.

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(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

| | | |
|--------------|-----------------|--------|
| 6,915,463 | VIEREGGE et al. | 7-2005 |
| 5,627,837 | GILLET | 5-1997 |
| 6,775,237 | SOLTYSIAK | 8-2004 |
| 2002/0018616 | LI | 2-2002 |

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| | | |
|-----------|------------------|--------|
| 7,113,698 | RYHORCHUK et al. | 9-2006 |
| 6,917,759 | DE BOER et al. | 7-2005 |

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-2 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al. (U.S. Patent 6,915,463 B2).

Regarding claims 1 and 22, Vieregge et al. teaches in FIG. 1 an optical ring network comprising a plurality of network nodes. Vieregge et al. teaches in FIG. 2 the structure of a network node comprising a quality determination module 20 and failure predictor module 22. Vieregge et al. teaches in col. 5, lines 49-64 the operation of the predictor 22. Vieregge et al. teaches in line 61 that two predictive thresholds (both below the failure threshold) may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made. That is Vieregge et al. teaches comparing collected BER values to a predetermined BER threshold level. Vieregge et al. teaches that if each of the two recent ones of said collected BER values exceed the predetermined BER threshold level, determining whether said collected BER values worsen over time and perform protection switch if the BER values worsen. The difference between Vieregge et al. and the claimed invention is that Vieregge et al. does not teach in the same paragraph storing said BER values. However Vieregge et al. teaches in col. 7, lines 5-7 storing BER values in a memory of the block 22. One of ordinary skill in the art would have been motivated to combine the teaching of col. 7, lines 5-7 with the method of col. 5, lines 49-64 because storing BER values in memory makes it easy to retrieve data for analysis. Thus it would have been obvious to one of ordinary skill in the art at

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the time the invention was made to store BER values in memory, as taught in col. 7, lines 5-7 of Vieregge et al., in the method of col. 5, lines 49-64 because storing BER values in memory makes it easy to retrieve data for analysis.

Regarding claim 2, Vieregge et al. teaches in col. 7, lines 7-9 that the block 20 continues to measure BER at periodic intervals.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al. (U.S. Patent 6,915,463 B2) in view of Gillett (U.S. Patent 5,627,837).

Vieregge et al. has been discussed above in regard to claim 1, 2 and 22. The difference between Vieregge et al. and the claimed invention is that Vieregge et al. does not teach array for storing the BER values. Gillett teaches in col. 6, lines 35-40 circular buffer known as array for storing data for processing. One of ordinary skill in the art would have combined the teaching of Gillett with the modified scheme of Vieregge et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an array for storing data for processing, as taught by Gillett, in the modified scheme of Vieregge et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Claims 7-9 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al. and Gillett as applied to claim 3 above, and further in view of Soltysiak et al. (U.S. Patent 6,775,237 B2).

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Vierегge et al. and Gillett have been discussed above in regard to claim 3. The difference between Vierегge et al. and Gillett and the claimed invention is that Vierегge et al. and Gillett do not teach using flag for counting. The use flag for counting is well known in the art. For example, Soltysiak et al. teaches in FIG. 3 counters (equivalent to flag of instant claim) for keeping track of events. One of ordinary skill in the art would have combined the teaching of Soltysiak et al. with the modified scheme of Vierегge et al. and Gillett because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use flag or counter for keeping track of events, as taught by Soltysiak et al., in the modified scheme of Vierегge et al. and Gillett because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vierегge et al. (U.S. Patent 6,915,463 B2) in view of Li (U.S. Patent Application Pub. 2002/0018616 A1) and Ryhorchuk et al. (U.S. Patent 7,113,698 B1).

Vierегge et al. has been discussed above in regard to claim 1, 2 and 22. The difference between Vierегge et al. and the claimed invention is that Vierегge et al. does not teach the details of the protection scheme. Li teaches in FIG. 3 a ring network. Li teaches in FIG. 23 a two-fiber ring where λ_k to the east side is the working channel for primary A. In a ring switch, traffic of primary A is switched to the same wavelength toward the west side. In a span switch, traffic of primary A is switched to λ_j toward the west side. One of ordinary skill in the art would have been motivated to combine the teaching of Li with the ring network of Vierегge et al.

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because the node architecture of Li is simple yet effective. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the protection scheme of Li in the ring network of Vieregge et al. because the node architecture of Li is simple yet effective.

The combination of Vieregge et al. and Li still fails to teach an out-of-band signal. Ryhorchuk et al. teaches in col. 8, lines 46-50 optical supervisory channel which carries out-of-band signal. It is also obvious that if the in-band data channel fails while the OSC channel is working, it indicates a channel failure and span switch is appropriate. If both the in-band data channel and the OSC channel fail, it indicates a fiber failure and ring switch is necessary. One of ordinary skill in the art would have been motivated to combine the teaching of Ryhorchuk et al. with the modified ring network of Vieregge et al. and Li because OSC channel can be used for communicating status information between nodes. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an OSC channel, as taught by Ryhorchuk et al., in the modified ring network of Vieregge et al. and Li because OSC channel can be used for communicating status information between nodes.

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (U.S. Patent Application Pub. 2002/0018616 A1) in view of Ryhorchuk et al. (U.S. Patent 7,113,698 B1).

Regarding claim 20, Li teaches in FIG. 3 a ring network. Li teaches in FIG. 23 a two-fiber ring where λ_k to the east side is the working channel for primary A. In a ring switch, traffic of primary A is switched to the same wavelength toward the west side. In a span switch, traffic

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of primary A is switched to λ_j toward the west side. (See paragraph [0052].) The difference between Li and the claimed invention is that Li does not teach an out-of-band signal. Ryhorchuk et al. teaches in col. 8, lines 46-50 optical supervisory channel which carries out-of-band signal. It is also obvious that if the in-band data channel fails while the OSC channel is working, it indicates a channel failure and span switch is appropriate. If both the in-band data channel and the OSC channel fail, it indicates a fiber failure and ring switch is necessary. One of ordinary skill in the art would have been motivated to combine the teaching of Ryhorchuk et al. with the ring network of Li because OSC channel can be used for communicating status information between nodes. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an OSC channel, as taught by Ryhorchuk et al., in the ring network of Li because OSC channel can be used for communicating status information between nodes.

Regarding claim 21, Li teaches that in span switch, both the working and protection channels are sent toward the east side and share the same multiplex. In ring switch, the protection channel is sent toward the west side which uses another multiplexer.

Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al., Gillett and Soltysiak et al. as applied to claims 7-9 and 24-26 above, and further in view of de Boer et al. (U.S. Patent 6,917,759).

Vieregge et al., Gillett and Soltysiak et al. have been discussed above in regard to claims 7-9 and 24-26. The difference between Vieregge et al., Gillett and Soltysiak et al. and the claimed invention is that Vieregge et al., Gillett and Soltysiak et al. do not teach transmitting a

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switching request periodically until the expiration of a predetermined time or until receipt of an acknowledgement signal. de Boer et al. teaches shared mesh protection scheme. de Boer et al. teaches in FIG. 7 detect failure step 118, transmit switching request step 124, ack received testing step 126 and timeout condition testing step 140. One of ordinary skill in the art would have combined the teaching of de Boer et al. with the modified scheme of Vieregge et al., Gillett and Soltysiak et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention to transmit a switching request periodically until the expiration of a predetermined time or until receipt of an acknowledgement signal, as taught by de Boer et al., in the modified scheme of Vieregge et al., Gillett and Soltysiak et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Regarding claim 28, de Boer et al. teaches in FIG. 7 establish protection path step 126.

GROUND OF REJECTION NOT ON REVIEW

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal because they have not been presented for review in the appellant's brief.

Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al. (U.S. Patent 6,917,759) in view of Hartmann et al. (U.S. Patent 6,851,062 B2).

Regarding claim 12, de Boer et al. teaches shared mesh protection scheme. de Boer et al. teaches in FIG. 7 detect failure step 118, transmit switching request step 124, ack received

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testing step 126 and timeout condition testing step 140. The difference between de Boer et al. and the claimed invention is that de Boer et al. does not teach how to determine the timeout interval. While an acknowledgement is an indication of the completion of a remote operation, timeout is an indication of the failure of a remote operation. It is obvious that the time interval between the transmitting of the remote operation command and the time an acknowledgement is expected to be received is the sum of the round trip time for messages to travel between the local node and the remote node and the operation time. If timeout interval is too small, failure of remote operation may be declared prematurely before an acknowledgement arrives. On the other hand, if timeout interval is too large, it delays actions for correcting the failure. That is, the timeout period should depend on the round trip time between local node and remote node. For example, Hartmann et al. teaches in col. 4, lines 44-65 a formula for calculating timeout based on round trip time. It is also obvious that the round time depends on the number of nodes in the network and the distance between the nodes. One of ordinary skill in the art would have been motivated to combine the teaching of Hartmann et al. with the protection scheme of de Boer et al. because timeout interval should be selected according to the expected time interval for receiving an acknowledgement as explained above. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine timeout interval based on number of nodes in the network and the distance between nodes, as taught by Hartmann et al. and common sense, in the protection scheme of de Boer et al.

Regarding claim 14, de Boer et al. teaches in FIG. 7 establish protection path step 126.

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Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al. and Hartmann et al. as applied to claims 12 and 14 above, and further in view of Vieregge et al. (U.S. Patent 6,915,463 B2).

de Boer et al. and Hartmann et al. have been discussed above in regard to claims 12 and 14. The difference between de Boer et al. and Hartmann et al. and the claimed invention is that de Boer et al. and Hartmann et al. do not teach determining failure by analyzing BER. Vieregge et al. teaches determining failure by analyzing BER as discussed above in regard to claims 1-2 and 22. One of ordinary skill in the art would have been motivated to combine the teaching of Vieregge et al. with the modified protection switching scheme of de Boer et al. and Hartmann et al. because the method of Vieregge et al. provides protection switch ahead of the failure and prevents service interruption. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the BER analyzing method of Vieregge et al. in the modified protection switching scheme of de Boer et al. and Hartmann et al. because the method of Vieregge et al. provides protection switch ahead of the failure and prevents service interruption.

Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al., Hartmann et al. and Vieregge et al. as applied to claim 15 above, and further in view of Soltysiak et al. (U.S. Patent 6,775,237 B2).

de Boer et al., Hartmann et al. and Vieregge et al. have been discussed above in regard to claim 15. The difference between de Boer et al., Hartmann et al. and Vieregge et al. and the claimed invention is that de Boer et al., Hartmann et al. and Vieregge et al. do not teach using

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flag for counting. The use flag for counting is well known in the art. For example, Soltysiak et al. teaches in FIG. 3 counters (equivalent to flag of instant claim) for keeping track of events. One of ordinary skill in the art would have combined the teaching of Soltysiak et al. with the modified scheme of de Boer et al., Hartmann et al. and Vieregge et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use flag or counter for keeping track of events, as taught by Soltysiak et al., in the modified scheme of de Boer et al., Hartmann et al. and Vieregge et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

(10) Response to Argument

Regarding claims 1-2, the Appellant explains on page 13 of the Brief the operation of Vieregge and alleges “Vieregge, however, fails to teach or suggest at least the limitations of ‘comparing each of a plurality of recent ones of said collected BER values to a predetermined BER threshold level; determining, for each of said recent ones of said collected BER values, whether said recent BER value exceeds said predetermined BER threshold level, wherein said recent ones of said collected BER values include a subset of said collected BER values; in response to a determination that each of said recent ones of said collected BER values exceeds the predetermined BER threshold level, determining whether said collected BER values worsen over time; and in response to a determination that said collected BER values worsen over time, detecting an indication of BER degradation,’ as claimed in Appellant's claim 1.”

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The Examiner disagrees. The Examiner presents the following table for mapping the teaching of Vieregge et al. to the limitations of claim 1.

| Claim 1 | Vieregge et al. |
|--|--|
| A method, comprising: | col. 3, lines 40-46: quality determination block 20 measures a raw quality measure which is assumed to be a BER; |
| (a) collecting a plurality of bit error rate (BER) values; | |
| (b) storing said BER values; | Vieregge et al. does not expressly teach storing BER; see remark B below. |
| (c) analyzing said BER values using a BER hysteresis algorithm | col. 4, lines 65-66: failure predictor block 22 which processes the raw quality measures |
| comparing each of plurality of recent ones of said collected BER values to | FIG. 3 and FIG. 4 show comparing BER to threshold IBr |
| a predetermined BER threshold level, | col. 5, line 27-28: threshold IBr |
| wherein said recent ones of said collected BER values include a subset of said collected BER values; | Inherently recent ones of said collected BER is a subset of said collected BER. |
| determining, for each of said recent ones of said collected BER values, whether said recent BER value exceeds said predetermined BER threshold level; | col. 5, lines 54-55: latest BER exceeding the threshold IBr |
| in response to a determination that each of said recent ones of said collected BER values exceeds the predetermined BER threshold level, determining whether said collected BER values worsen over time; | col. 5, lines 55-56: also exceed some value indicating that a failure is likely; see remark A below. |
| in response to a determination that said collected BER values worsen over time, detecting an indication of BER degradation; and | col. 5, lines 34-38: BER starts to increase; predictor decides failure likely to occur |
| (d) switching a transmission port in response to said indication of BER degradation. | col. 5, lines 36-37 and 42-47: restoration and protection switching to new path starts. |

Remark A. Vieregge et al. teaches in col. 5, lines 9-10 that the predictor block 22 make a decision whether a failure is likely to occur. A decision that a failure is likely to occur implies

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that the BER values worsen over time. Vieregge et al. also teaches in col. 5, lines 61-64 that two predictive thresholds (both below the failure threshold) may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made. To the understanding of the Examiner, this scheme works as follows. The bottom part of FIG. 4 of Vieregge et al. is reproduced below with an added threshold IBs as suggested by Vieregge et al. Both IBr and IBs are below the failure threshold IBf as suggested by Vieregge et al.

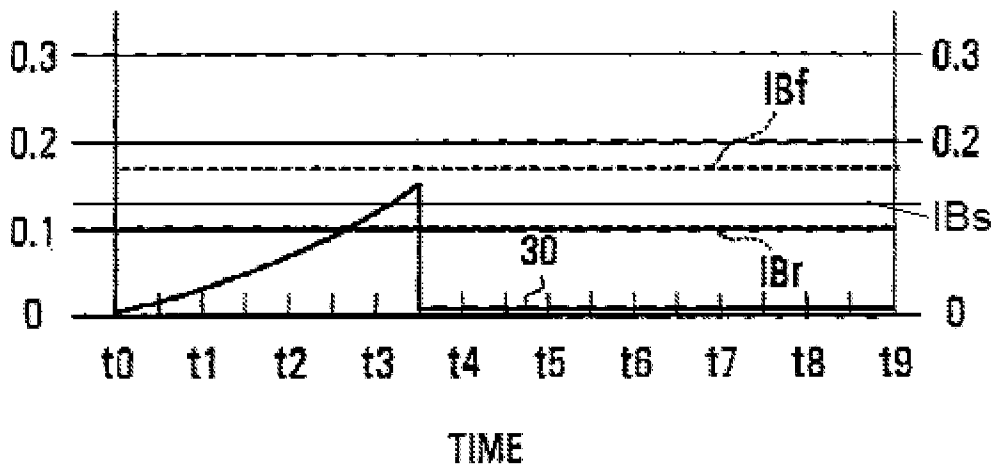


FIG. 4

The above diagram illustrates that IBr is crossed between t2 and t3 and IBs is crossed at t3. Let us assume that the time period between these two points is short enough. Vieregge et al. teaches that if the two thresholds IBr and IBs are crossed in a short enough period of time, then the decision to instigate protection switching is made. One of ordinary skill in the art would have understood that the crossing of the threshold IBr follows by the crossing of IBs in a short enough period of time indicates that the BER values are worsen over time. Also crossing IBs

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implies exceeding IBr. That is, “each of said recent ones of said collected BER values exceeds the predetermined BER threshold level” as recited in claim 1.

Remark B. Vieregge et al. does not expressly teach storing BER and only the comparison results of the BER to the threshold is needed for making the decision. However, Vieregge et al. teaches in col. 7, lines 1-34 a modified embodiment that stores BER values in a memory. One of ordinary skill in the art would have been motivated to combine the teaching of col. 7, lines 5-7 with the method of col. 5, lines 49-64 because storing BER values in memory makes it easy to retrieve data for analysis. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to store BER values in memory, as taught in col. 7, lines 5-7 of Vieregge et al., in the method of col. 5, lines 49-64 because storing BER values in memory makes it easy to retrieve data for analysis.

The Appellant then argues on page 13 of the Brief

“In the Final Office Action, dated November 19, 2008, the Examiner cites a specific portion of Vieregge (namely, Col. 5, Lines 49 - 64) asserting that the cited portion of Vieregge discloses these limitations of the analyzing step of Appellant's claim 1. Appellant respectfully disagrees.”

“Appellant respectfully submits that the portion of Vieregge cited by the Examiner fails to disclose the limitations of the analyzing step of Appellant's claim 1. As disclosed in the cited portion of Vieregge, in one embodiment ‘...the failure predictor could require that in addition to the latest BER exceeding the threshold IBr, a rate of increase (for example between two consecutive measurements) must also exceed some value indicating that a failure is likely with the assumption that a slow increase is less likely to be indicative of

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an imminent failure.’ (Vieregge, Col. 5, Lines 52 - 58). As further disclosed in the cited portion of Vieregge, in another embodiment ‘...two predictive thresholds (both below the failure threshold may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made.’ (Vieregge, Col. 5, Lines 58 - 64).”

“With respect to the first embodiment described in the cited portion of Vieregge, Appellant submits that steps of determining whether a last BER value exceeds a threshold and determining whether a rate of increase between two consecutive BERs exceeds a value, as disclosed in Vieregge, does not teach or suggest comparing each of a plurality of recent ones of collected BER values to a predetermined BER threshold level, determining whether the recent ones of the collected BER values exceed a predetermined BER threshold level, and, in response to a determination that each of the recent ones of the collected BER values exceeds the predetermined BER threshold level, determining whether collected BER values (of which the recent BER values are a subset) worsen over time, as claimed in Appellant's claim 1.”

The Examiner disagrees and provides the following analysis. Vieregge et al. teaches in col. 5, lines 53-57 “the failure predictor could require that in addition to the latest BER exceeding the threshold IBr, a rate of increase must also exceed some value indicating that a failure is likely”. First, one needs a first BER and a second BER to calculate a rate of increase. Let BER1 and BER2 denote two BER values measured at T1 and T2 where T2 is more recent than T1. A rate of increase can be calculated as

$$rate = \frac{BER2 - BER1}{T2 - T1}.$$

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Vieregge et al. teaches comparing the BER to the predetermined threshold IBr. Vieregge et al. teaches that these BER values exceed IBr. Furthermore, Vieregge et al. teaches that the failure indicator determines whether the rate of increase exceeds some value. If the rate of increase exceeds the value, a failure is likely. That is, the failure indicator, based on the fact that the rate of increase exceeds the value, determines that a failure is likely, which is equivalent to “the BER is worsen over time” that it will cross IBf soon, as understood by the Examiner or one of ordinary skill in the art.

The Appellant argues on page 14 of the Brief

“With respect to the second embodiment described in the cited portion of Vieregge, Appellant submits that determining if two thresholds are crossed in a short enough period of time, as disclosed in Vieregge, fails to teach or suggest comparing each of a plurality of recent ones of collected BER values to a predetermined BER threshold level, determining whether the recent ones of the collected BER values exceed a predetermined BER threshold level, and, in response to a determination that each of the recent ones of the collected BER values exceeds the predetermined BER threshold level, determining whether the collected BER values (of which the recent BER values are a subset) worsen over time, as claimed in Appellant's claim 1.”

The Examiner disagrees. As explained above in the mapping between the teaching of Vieregge et al. and the claimed limitations, Vieregge et al. teaches these limitations.

The Appellant argues on page 15 of the Brief

“Thus, Appellant submits that Vieregge, including the portions of Vieregge cited by the Examiner, fails to teach or suggest the specific arrangement of Appellant's claim 1.

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Appellant's claim 1 includes limitations of collecting BER values, comparing each of a plurality of recent ones of the collected BER values to a predetermined BER threshold level, determining for each of the recent ones of the collected BER values whether the recent BER value exceeds the predetermined BER threshold level, and in response to a determination that each of the recent ones of the collected BER values exceeds the predetermined BER threshold level, determining whether the collected BER values worsen over time. As claimed in Appellant's claim 1, the recent ones of the collected BER values compared to the predetermined BER threshold level include a subset of the collected BER values which are evaluated to determine whether BER values worsen over time. An example of this may be seen by way of reference to Figure 3 of Appellant's originally-filed application, in which the collected BER values include ten (10) BER values and the recent ones of the collected BER values include three (3) BER values. This may be seen from the combination of steps 310, 312, 314, and 316. As depicted in Figure 3 of Appellant's application, each time a recent BER value exceeds the threshold, a FLAG counter value (which is initialized to 0) is incremented by one. As further depicted in Figure 3 of Appellant's originally-filed application, after the value of the FLAG counter is greater than two (see step 314), which indicates that the three most recent BER values (of the ten most recently collected BER values) each exceed a BER threshold, the ten collected BER values are compared to determine if the ten collected BER values worsen over time (see step 318). In other words, when each of a plurality of recent BER values, which are a subset of a larger set of collected BER values, exceeds a BER threshold, a determination is made as to whether the larger set of collected BER values

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worsens over time. By contrast, as described hereinabove, Vieregge merely discloses determining if the latest BER value exceeds a threshold and determining that a rate of increase between two consecutive measurements must exceed some value, or determining if two thresholds are crossed in a short enough period of time. Vieregge fails to teach or suggest determining whether a set of collected BER values worsen over time, in response to a determination that each of a plurality of BER values in a subset of that set of collected BER values exceeds a BER threshold.”

In response, the Examiner recognizes that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Vieregge et al. may not teach a FLAG counter and increasing the FLAG counter when a recent BER exceeds a threshold. However, these limitations (i.e., FLAG counter and increasing the FLAG counter when a recent BER exceeds a threshold) are not recited in claim 1.

The Appellant argues on page 16 of the Brief

“In the Final Office Action, the Examiner, citing Col. 5, Lines 49 - 64 of Vieregge, asserts that ‘Vieregge et al. teaches in line 61 that two predictive thresholds (both below the failure threshold) may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made.’ Then, on the basis of the cited portion of Vieregge, the Examiner concludes that ‘... Vieregge et al. teaches comparing collected BER values to a predetermined BER threshold level. Vieregge et al. teaches that if each of the two recent ones of said collected BER values exceed the predetermined BER threshold level, determining whether said collected BER

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values worsen over time and perform protection switch if the BER values worsen.’ (Office Action, Pg. 2). Appellant respectfully disagrees.”

“With respect to the Examiner's arguments in the Final Office Action, the Appellant submits that the Examiner's conclusions regarding the teachings of Vieregge do not comport with the teachings of Vieregge. As noted by the Examiner, the cited portion of Vieregge states that "...two predictive thresholds (both below the failure threshold) may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made." (Vieregge, Col. 5, Lines 61 - 64). The cited portion of Vieregge does not support the Examiner's conclusion that Vieregge discloses that if each of the two recent ones of collected BER values exceed the predetermined BER threshold level, determining whether the collected BER values worsen over time and performing a protection switch if the BER values worsen. The cited portion of Vieregge is devoid of any teaching or suggestion of determining if BER values worsen over time. Thus, the Examiner's conclusions regarding the teachings of Vieregge do not comport with the teachings of Vieregge and, therefore, the Examiner has failed to establish a prima facie case of obviousness of Appellant's claim 1.”

The Examiner disagrees. First, Vieregge et al. teaches that under such condition, restoration/switchover starts. The fact that the failure predictor decides to switchover implies that the failure predictor determines that BER worsen over time; otherwise why bother to switchover. Second, as explained above with the mapping between claimed limitations and Vieregge et al., the cited portion of Vieregge et al. reads on the limitations.

The Appellant argues on page 16 of the Brief

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"In the Response to Arguments section of the Final Office Action, dated November 19, 2008, the Examiner argues that 'Vieregge et al. teaches in col. 5, lines 61 - 64 to use two predictive thresholds..., and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made. Note that inherently, or obviously, the second predictive threshold is higher than the first predictive threshold and the two samples both exceed the lower predictive threshold.' (Final Office Action, Pg. 11). In the Response to Arguments section of the Final Office Action, dated November 19, 2008, the Examiner makes a similar argument, and then concludes that '...Vieregge et al. teaches making a decision based on a plurality of recent ones of the collected BER.' (Office Action, Pg. 12). Appellant respectfully disagrees."

"In response to the Examiner's arguments in the Response to Arguments section of the Final Office Action, the Appellant notes that the cited portion of Vieregge fails to teach or suggest the limitations associated with the analyzing step of Appellant's claim 1. As noted by the Examiner, the cited portion of Vieregge states that if two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made. A statement that a decision to instigate protection switching is made if two thresholds are crossed in a short enough period of time, as disclosed in Vieregge, does not teach or suggest comparing each of a plurality of recent ones of collected BER values to a predetermined BER threshold level, determining whether the recent ones of the collected BER values exceed a predetermined BER threshold level, and, in response to a determination that each of the recent ones of the collected BER values exceeds the predetermined BER threshold level, determining whether the collected BER values (of

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which the recent BER values are a subset) worsen over time, as claimed in Appellant's claim 1."

"In response to the Examiner's arguments in the Response to Arguments section of the Final Office Action, the Appellant further notes that the Examiner's arguments and associated conclusion fail to address the specific limitations of Appellant's claim 1. Namely, on the basis of the cited portion of Vieregge, the Examiner concludes that Vieregge discloses making a decision on the basis of a plurality of recent ones of collected BER values. Appellant's claim 1, however, does not merely claim making a decision based on a plurality of recent ones of collected BER values. Rather, as noted hereinabove, Appellant's claim 1 includes specific limitations of comparing each of a plurality of recent ones of collected BER values to a predetermined BER threshold level, determining whether the recent ones of the collected BER values exceed a predetermined BER threshold level, and, in response to a determination that each of the recent ones of the collected BER values exceeds the predetermined BER threshold level, determining whether the collected BER values (of which the recent BER values are a subset) worsen over time, as claimed in Appellant's claim 1. Vieregge is devoid of any teaching or suggestion of these limitations."

The Examiner disagrees. The Appellant's argument amounts to a general allegation that the reference does not teach the claimed limitations without specifically pointing out how the language of the claims patentably distinguishes them from the reference. As explained above, the teaching of Vieregge et al. matches the limitations of the claimed invention except for the

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limitation of “storing said BER values”. However, the storing step is obvious in view of another embodiment of Vieregge et al. as explained in the rejection.

Regarding claim 22, the Appellant presents on pages 18-24 arguments similar to those of claim 1. These arguments have been addressed above in regard to claim 1.

Regarding claims 20-21, the Appellant argues on page 27 of the Brief that Li and Ryhorchuk, alone or in combination, fail to teach or suggest at least the limitations of "in response to detection of a condition on said first optical channel without detection of a condition on said second optical channel, switching the in-band signal to a third optical channel using a span switch operation" and "in response to detection of a condition on said first optical channel and detection of a condition on said second optical, switching the in-band signal to a third optical channel using a ring switch operation," as recited in claim 20.

The Appellant first attacks the Li reference alone and argues that Li fails to teach or suggest use of an out-of-band signal and, thus, fails to teach or suggest switching an in-band signal to a third optical channel in response to detection of a condition on a first optical channel without detection of a condition on the second optical channel (which conveys an out-of-band signal) or switching the in-band signal to a third optical channel in response to detection of a condition on the first optical channel and detection of a condition on the second optical channel.

As stated in the Office Action, the Examiner admits that Li fails to teach or suggest use of an out-of-band signal and cites Ryhorchuk et al. as evidence to show that the difference between Li and the claimed invention is obvious to one of ordinary skill in the art at the time the invention was made.

The Appellant argues on page 28 of the Brief

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“Ryhorchuk, however, alone or in combination with Li, fails to teach or suggest at least the limitations of ‘in response to detection of a condition on said first optical channel without detection of a condition on said second optical channel, switching the in- band signal to a third optical channel using a span switch operation’ and ‘in response to detection of a condition on said first optical channel and detection of a condition on said second optical, switching the in-band signal to a third optical channel using a ring switch operation,’ as claimed in Appellant's claim 20.”

...

“Furthermore, Appellant notes that, based on the teachings of Li and Ryhorchuk, a system according to the combination of Li and Ryhorchuk would merely disclose a system in which protection switching may be performed using span or ring switch operations, and in which an optical supervisory channel may be used to exchange status information between nodes. In other words, a system according to the combination of Li and Ryhorchuk merely discloses presence of in-band and out-of-band signals within the same system, however, a system according to the combination of Li and Ryhorchuk fails to disclose use of a combination of the in-band signal and the out-of-band signal in the manner claimed in Appellant's claim 20. Namely, a system according to the combination of Li and Ryhorchuk fails to disclose performing a span switch operation or a ring switch operation based on a combination of the presence/absence of conditions on optical channels conveying in-band and out-of-band signals. Thus, a system according to the combination of Li and Ryhorchuk fails to disclose switching an in-band signal to a third optical channel using a span switch operation in response to detection of a condition on

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the first optical channel without detection of a condition on the second optical channel or switching the in-band signal to a third optical channel using a ring switch operation in response to detection of a condition on the first optical channel and detection of a condition on the second optical, as claimed in Appellant's claim 20."

"Thus, Li and Ryhorchuk, alone or in combination, fail to teach or suggest switching an in-band signal to a third optical channel using a span switch operation in response to detection of a condition on the first optical channel without detection of a condition on the second optical channel or switching the in-band signal to a third optical channel using a ring switch operation in response to detection of a condition on the first optical channel and detection of a condition on the second optical, as claimed in Appellant's claim 20."

Appellant's argument is not persuasive. Before addressing Appellant's argument, it is helpful to discuss the two kinds of protection switching, namely, ring switch and span switch, that are recited in claim 20.

A ring is a high redundant architecture where nodes are arranged in a ring shape and adjacent nodes are connected with a link that comprises a plurality of fibers. In a ring network, each pair of nodes is connected by paths that travel in a clockwise direction as well as by paths that travel in a counterclockwise direction. Usually, traffic between a pair of nodes travel in the direction where the path is shorter. For example, FIG. 3 of Li shows a ring network. Traffic from node A to node B travels in the clockwise direction while traffic from node B to node A travels in the counterclockwise direction. Furthermore, each link is equipped with working and protection channels. When a failure occurs, traffic affected by the failure is switched from a

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working channel to a protection channel. Depending on the failure mode, one of the two protection switching (i.e., ring switch and span switch) can be used. In a ring switch (Ryhorchuk et al. calls this ring switch or line switch), traffic is switched to a protection channel and travels in a direction that is opposite to the direction that it travels under normal condition. In a span switch (Ryhorchuk et al. calls this equipment switch), traffic is switched from a working channel to a protection channel and continues to travel on the same direction as that under normal condition. It is noted that the protection channels may carry low priority traffic that will be exempted during a protection switching. Since traffic travels a longer distance in a ring switch, a ring switch is more costly than a span switch. The network must decide when to use ring switch and when to use span switch. Li teaches in paragraphs [0037] to [0046] that when a fiber cut in a four-fiber or component failures occur, span switch is used for restoring the traffic; and when a cable cut occurs, a ring switch is used for restoring the traffic. In a two-fiber ring, a ring switch must be used for a fiber cut because there is no other fiber that carries traffic in the same direction. Ryhorchuk et al. teaches in Table 1, column 3 (col. 14, lines 25-30) that (1) if no OSC signal, initiate ring switch; or (2) if OSC signal present, do not initiate ring switch.

With the above background information, the Examiner's response to the arguments raised by the Appellant follows. First, the Appellant admits that the combination of Li and Ryhorchuk discloses presence of in-band and out-of-band signals within the same system. That is, the combination of Li and Ryhorchuk teaches the limitations "transmitting an in-band signal via a first optical channel towards a multiplexer" and "transmitting an out-of-band signal via a second optical channel towards said multiplexer". Furthermore, Ryhorchuk et al. teaches in Table 1, column 3 (col. 14, lines 25-30) that (1) if no OSC signal, initiate ring switch; or (2) if OSC signal

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present, do not initiate ring switch, i.e., initiate a span switch instead. The working channel, the OSC channel and the protection channel correspond to the first optical channel, the second optical channel and the third optical channel, respectively, in claim 20. That is, the combination of Li and Ryhorchuk teaches the rest of the limitations in claim 20. The Examiner has also articulated motivation for combining the two references. Therefore, the Examiner has established a prima facie case of obviousness for claim 20.

The Appellant argues on page 29 of the Brief

“the Examiner's reasoning fails to support the Examiner's conclusion of the obviousness of Appellant's claim 20. As noted in the Final Office Action, dated November 19, 2008, the Examiner's reasoning for the rejection of claim 20 is associated with communication of status information on the OSC channel of Ryhorchuk. Specifically, the Examiner states that ‘[o]ne of ordinary skill in the art would have been motivated to combine the teachings of Ryhorchuk et al. with the ring network of Li because OSC channel can be used for communicating status information between nodes. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an OSC channel, as taught by Ryhorchuk et al., in the ring network of Li because OSC channel can be used for communicating status information between nodes.’ (Final Office Action, Pg. 8, Emphasis added). As claimed in Appellant's claim 20, however, a span switch operation or a ring switch operation is performed based on the presence/absence of conditions on optical channels conveying in-band and out-of-band signals. Namely, in response to detection of a condition on a first optical channel without detection of a condition on a second optical channel, an in-band signal is switched to a third optical

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channel using a span switch operation, and, in response to detection of a condition on a first optical channel and detection of a condition on a second optical, an in-band signal is switched to a third optical channel using a ring switch operation. The communication of measured/collected status information on an OSC channel, as disclosed in Ryhorchuk, has nothing to do with performing a span switch operation or a ring switch operation based on the presence/absence of conditions on optical channels conveying in-band and out-of-band signals. Thus, the Examiner's reasoning does not support a finding of obviousness of Appellant's claim 20 and, therefore, the rejection is improper."

The Examiner disagrees. Li teaches in paragraphs [0037] to [0046] that when a fiber cut in a four-fiber or component failures occur, span switch is used for restoring the traffic; and when a cable cut occurs, a ring switch is used for restoring the traffic. Of course, one of ordinary skill in the art understands that the switching decision is made not based on the fact. Instead, the switch decision is made based on the symptoms. It may take a long time (hours) to find out whether the actual failure is a fiber cut, a cable cut or a equipment failure while protection switching must be done within fraction of a second. Ryhorchuk et al. teaches in col. 14, Table 1 to make decision based on the symptoms. (The first column lists the symptoms, the second column lists the likely causes and the last column lists the decision.) The symptoms of a cable cut are failures of multiple channels while the symptom for an equipment failure is a failure of a single channel regardless of the intended use of the channels. Therefore, it does not matter whether a channel is a payload channel or a supervisory channel, as long as there are failures on multiple channels, a ring switch should be initiated and if only one channel fails, a span switch should be performed.

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The Appellant argues on page 30 of the Brief

“In the Final Office Action, dated November 19, 2008, the Examiner fails to cite any portion of Li or Ryhorchuk which discloses switching an in-band signal to a third optical channel using a span switch operation in response to detection of a condition on the first optical channel without detection of a condition on the second optical channel or switching the in-band signal to a third optical channel using a ring switch operation in response to detection of a condition on the first optical channel and detection of a condition on the second optical, as claimed in Appellant's claim 20. Rather, the Examiner merely makes a conclusory statement that ‘[i]t is also obvious that if the in- band data channel fails while the OSC channel is working, it indicates a channel failure and span switch is appropriate. If both the in-band data channel and the OSC channel fail, it indicates a fiber failure and ring switch is necessary.’ (Office Action, Pg. 8).”

“Appellant notes that the Examiner fails to cite any portion of Li or Ryhorchuk as the basis for this conclusion and, further, fails to provide any other basis for this conclusion. Thus, since neither of the references cited by the Examiner discloses the arrangement of Appellant's claim 1, and the Examiner provides no other basis of support for this conclusory statement, Appellant submits that the Examiner must be relying on inherency to meet the limitations of Appellant's claim 20.”

The Examiner remarks that neither Li nor Ryhorchuk et al. is relied upon for rejecting claim 1, therefore, whether Li and Ryhorchuk et al. disclose the arrangement of claim 1 or not is irrelevant to the patentability of claim 1.

The Appellant continues the argument on page 30 of the Brief

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“The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (emphasis added). See MPEP § 2112. To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' In re Robertson, 169 F.3d 743, 745, 49 USPQ.2d 1949, 1950-51 (Fed. Cir. 1999). See id.”

“Li and Ryhorchuk do not inherently teach that if the in-band data channel fails while the OSC channel is working it indicates a channel failure and span switch is appropriate, or that if both the in-band data channel and the OSC channel fail it indicates a fiber failure and ring switch is necessary, because Li and Ryhorchuk do not necessarily require that if the in-band data channel fails while the OSC channel is working it indicates a channel failure and span switch is appropriate, or that if both the in-band data channel and the OSC channel fail it indicates a fiber failure and ring switch is necessary. Thus, the Examiner's argument deals in probabilities and possibilities, which are insufficient to establish inherency. Robertson, 49 USPQ2d at 1950.”

The Applicant's argument is not persuasive. Since in a WDM system, the OSC channel and the in-band channels are carried by the same fiber, if the in-band data channel fails while the OSC channel is working, it cannot, and must not, be a fiber/cable cut and a span switch is appropriate. If both the in-band data channel and the OSC channel fail, it is obvious, if not

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inherent, that a fiber/cable cut has likely occurred and a ring switch is appropriate in a two-fiber ring. Furthermore, Ryhorchuk et al. clearly teaches in Table 1, column 3 (col. 14, lines 25-30) that (1) if no OSC signal, initiate ring switch; or (2) if OSC signal present, do not initiate ring switch, i.e., initiate a span switch instead.

The Appellant argues on page 32 of the Brief

“Furthermore, Appellant respectfully submits that the Examiner has failed to establish a prima facie case of obviousness of Appellant's claim 20, because the Examiner has failed to address the limitations of transmitting an in-band signal via a first optical channel towards a multiplexer and transmitting an out-of-band signal via a second optical channel towards the multiplexer, i.e., toward the same multiplexer, as claimed in Appellant's claim 20.”

“The Examiner has failed to cite any portion of Li or Ryhorchuk which discloses transmitting an in-band signal via a first optical channel towards a multiplexer and transmitting an out-of-band signal via a second optical channel towards the same multiplexer, as claimed in Appellant's claim 20. Furthermore, in the absence of such a citation to Li and/or Ryhorchuk, the Examiner has failed to provide any reasoning addressing the limitations of transmitting an in-band signal via a first optical channel towards a multiplexer and transmitting an out-of-band signal via a second optical channel towards the multiplexer, as claimed in Appellant's claim 20. The Examiner simply does not address this limitation of Appellant's claim 20.”

The Examiner disagrees. Li teaches in FIG. 23 multiplexer for wavelength division multiplexing wavelength channels. Ryhorchuk et al. teaches in FIG. 7 multiplex section 730

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where channels are multiplexed to share a fiber. OSC is a wavelength channel and it is understood that it is multiplexed together with other wavelength channels as illustrated in FIG. 23 of Li. Also, the Examiner recognizes that instant application does not disclose any special multiplexer or solving a problem related to multiplexing wavelength channels. The use of a multiplexer for multiplexing two channels does not differentiate the claimed invention from the combination of Li and Ryhorchuk et al.

The Appellant argues on page 32 of the Brief

“As described hereinabove, the Examiner admits that Li fails to teach or suggest use of an out-of-band signal. Thus, Li also must fail to teach or suggest transmitting an in-band signal via a first optical channel towards a multiplexer and transmitting an out-of-band signal via a second optical channel towards the multiplexer, as claimed in Appellant's claim 20. Furthermore, although Ryhorchuk discloses an OSC channel, Ryhorchuk is devoid of any teaching or suggestion that an in-band signal and the OSC signal are both transmitted toward a common multiplexer. Thus, Li and Ryhorchuk, alone or in combination, fail to teach or suggest transmitting an in-band signal via a first optical channel towards a multiplexer and transmitting an out-of-band signal via a second optical channel towards the multiplexer, as claimed in Appellant's claim 20.”

The Examiner disagrees. An optical supervisory channel is a wavelength channel. It differs from the payload channel only by its intended use. Li does not teach to use any channel for carrying status information. However, Li teaches multiplexing wavelength channel together for sharing a fiber. Therefore, the use of a multiplexer for wavelength division multiplexing an

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in-band channel and an optical supervisory channel is obvious in view of the combination of Li and Ryhorchuk et al.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/S. K. L./

Primary Examiner, Art Unit 2613

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